



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,772	10/17/2003	Toyohiko Mitsuzawa	Q77942	7752
23373 7590 12/18/2008				
SUGHRUE MION, PLLC				
2100 PENNSYLVANIA AVENUE, N.W.				
SUITE 800				
WASHINGTON, DC 20037				
EXAMINER				
FIDLER, SHELBY LEE				
ART UNIT		PAPER NUMBER		
2861				
MAIL DATE		DELIVERY MODE		
12/18/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/686,772

Applicant(s)

MITSUZAWA, TOYOHICO

Examiner

SHELBY FIDLER

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 9/26/2008 & 10/21/2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6 and 14 is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-13, 15 and 17 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/06)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Responsive Office Action

This Office Action is responsive to Applicant's amendments and remarks filed 9/26/2008.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Printing Apparatus Having Appropriate Correction of Feed Amount.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 8-9, 12-13, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asano et al. (US 2002/0140794 A1) in view of Walker et al. (US 6158344).

Regarding claim 1:

Asano et al. disclose a printing apparatus comprising:

a plurality of print heads (heads 904);

a moving member (carriage 902) that moves along a main-scanning direction (paragraph 72) and that is provided with the plurality of print heads (Fig. 9B);

a feed mechanism (Y-axis motor 909) that feeds a medium to be printed (paragraph 72); and

a drive member (timing belt 907) that is connected to the moving member at a connecting section (paragraph 72 & Figs. 9) and that drives the moving member along the main-scanning direction (paragraph 72), wherein

a predetermined print head (e.g. cyan head 902C) is a print head other than the print head that is furthest away from the connecting section in a direction perpendicular to the main-scanning direction, among the plurality of print heads (Fig. 9B).

Asano et al. do not expressly disclose that the printing apparatus comprises a controller that makes the predetermined print head eject ink on the medium to be printed to form dots for correcting a feed amount by which the feed mechanism feeds the medium to be printed, while moving the moving member.

However, Walker et al. disclose a printing apparatus comprising a controller (microprocessor 40) that makes a single predetermined print head (printhead 16) eject ink on a medium (paper 15) to form dots for correcting a feed amount by which a feed mechanism feeds the medium, while moving a moving member (col. 6, lines 19-31). Walker et al. teach that, by doing so, the printing apparatus is able to correct an advance value and control a nominal position of the feed mechanism (col. 4, lines 1-13).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to control one of Asano et al.'s four print heads to form the pattern disclosed by Walker et al. A person of ordinary skill in the art would realize that Walker et al.'s pattern could be printed by any of Asano et al.'s four print heads, and would have found it obvious to control the cyan print head to do so, since a person of ordinary skill in the art has good reason to pursue the known options within his or her technical grasp.

Regarding claim 2:

Asano et al. as modified by Walker et al. discloses all the limitations of claim 1, and **Asano et al. also disclose** that the predetermined print head (902C) is the print head, among the plurality of print heads, that is least susceptible to the vibration caused by moving the moving member (Fig. 9B).

Regarding claim 3:

Asano et al. as modified by Walker et al. discloses all the limitations of claim 1, and **Asano et al. also disclose** that the predetermined print head (e.g. 902C) is the print head that is located the closest to a connecting section at which the moving member and the drive member are connected to each other (Fig. 9B).

Regarding claim 4:

Asano et al. as modified by Walker et al. discloses all the limitations of claim 1, and **Walker et al. also disclose** that the dots for correcting the feed amount by which the feed mechanism feeds the medium to be printed are formed on edge sections of the medium to be printed by ejecting ink from the predetermined print head, among

the plurality of print heads, while moving the moving member (col. 6, lines 19-31 & Fig. 10).

Regarding claim 5:

Asano et al. as modified by Walker et al. discloses all the limitations of claim 1, and **Walker et al. also disclose** that the dots for correcting the feed amount by which the feed mechanism feeds the medium to be printed are formed on the medium to be printed by ejecting ink from predetermined nozzles provided in the predetermined print head (col. 6, lines 19-31).

Regarding claim 8:

Asano et al. as modified by Walker et al. discloses all the limitations of claim 1, and **Walker et al. also disclose** that the dots for correcting the feed amount by which the feed mechanism feeds the medium to be printed are formed on the medium to be printed when power is supplied to the printing apparatus (inherent to the operation described in col. 6, lines 19-31).

Regarding claim 9:

Asano et al. as modified by Walker et al. discloses all the limitations of claim 1, and **Walker et al. also disclose** that the dots for correcting the feed amount by which the feed mechanism feeds the medium to be printed are formed on the medium to be printed during a printing operation of the printing apparatus (col. 6, lines 19-31).

Regarding claim 12:

Asano et al. as modified by Walker et al. discloses all the limitations of claim 1, and **Walker et al. also disclose** that the dots for correcting the feed amount by

which the feed mechanism feeds the medium to be printed are formed on the medium to be printed when a print mode of the printing apparatus has been changed (into the calibration pattern printing mode – col. 6, lines 19-24).

Regarding claim 13:

Asano et al. as modified by Walker et al. discloses all the limitations of claim 1, and **Walker et al. also disclose** that at least two correction amounts (interval errors) for correcting the feed amount by which the feed mechanism to be printed are obtained based on the dots formed on the medium to be printed (col. 5, lines 43-48), and based on an average value of the correction amounts that are obtained, the feed amount by which the feed mechanism feeds the medium to be printed is corrected (col. 5, lines 52-58).

Regarding claim 17:

Asano et al. as modified by Walker et al. discloses all the limitations of claim 1, and **Asano et al. also disclose** that the driving member (907) extends along the moving member (902) in the main scanning direction (Fig. 9B).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Asano et al. as modified by Walker et al., as applied to claim 1 above, and further in view of Takemura et al. (US 5988784).

Regarding claim 7:

Asano et al. as modified by Walker et al. disclose all the limitations of claim 1, **but does not expressly disclose** that whether or not dots for correcting the feed

amount should be formed is determined according to a value of the temperature around the printing apparatus.

However, Takemura et al. disclose that a decision of whether or not to form dots for correcting a feed amount is made according to a value of a temperature around the printing apparatus (col. 15, lines 25-37).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to improve Asano et al.'s modified printing apparatus by controlling a decision whether or not to form dots for correcting a feed amount according to the temperature around the printing apparatus, such as suggested by Takemura et al. Motivation for doing so, as provided by Takemura et al., is to account for changes in speed of conveyance that occur with a change in environmental conditions (col. 17, lines 1-13).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Asano et al. as modified by Walker et al., as applied to claim 1 above, and further in view of Izumi et al. (US 6568784 B2).

Regarding claim 10:

Asano et al. as modified by Walker et al. disclose all the limitations of claim 1, **but do not expressly disclose** that the dots for correcting the feed amount by which the feed mechanism feeds the medium to be printed are formed on the medium to be printed when the medium to be printed has been exchanged.

However, Izumi et al. disclose the process of providing feed amount correction for sheets of differing thickness and coefficient of friction (col. 19, lines 12-18), since sheets of differing thickness cause the feed amount to vary (col. 6, lines 53-67).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to improve the printing apparatus of Asano et al. as modified by Walker et al. by forming the dots for correcting the feed amount when the medium has been exchanged, such as suggested by Izumi et al.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Asano et al. as modified by Walker et al. and Izumi et al., as applied to claim 10 above, and further in view of Elgee et al. (US 6450634 B2).

Regarding claim 11:

Asano et al. as modified by Walker et al. and Izumi et al. discloses all the limitations of claim 10, **but does not expressly disclose** that the printing apparatus also comprises a detector for detecting whether or not the medium to be printed has been exchanged, wherein, when it has been detected by the detector that the medium has been exchanged, the dots for correcting the feed amount by which the feed mechanism feeds the medium to be printed are formed on the medium to be printed.

However, Elgee et al. disclose a printing apparatus (printing device 20) provided with a detector (print media detector 86) for detecting the type of medium to be printed (col. 9, lines 22-57), so that, when the detector detects the type of medium to be printed, the printing apparatus may control one or more printing parameters based on

the detection results (col. 10, lines 8-10) so as to optimize printing on a variety of different types of media (col. 1, lines 33-41).

Therefore, at the time of invention, it would have been obvious to include into Asano et al.'s modified printing apparatus a detector for detecting the type of medium to be printed, so that the printing apparatus may form dots for correcting the feed amount based on the type of detected media.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Asano et al. as modified by Walker et al., as applied to claim 1 above, and further in view of Elgee et al. (US 6450634 B2) and Izumi et al. (US 6568784 B2).

Regarding claim 15:

Asano et al. as modified by Walker et al. discloses all the limitations of claim 1, **but does not expressly disclose** that the printing apparatus also comprises a detector for detecting whether or not the medium to be printed has been exchanged, wherein, when it has been detected by the detector that the medium has been exchanged, the dots for correcting the feed amount by which the feed mechanism feeds the medium to be printed are formed on the medium to be printed.

However, Elgee et al. disclose a printing apparatus (printing device 20) provided with a detector (print media detector 86) for detecting the type of medium to be printed (col. 9, lines 22-57), so that, when the detector detects the type of medium to be printed, the printing apparatus may control one or more printing parameters based on

the detection results (col. 10, lines 8-10) so as to optimize printing on a variety of different types of media (col. 1, lines 33-41); and

Izumi et al. disclose the process of providing feed amount correction for sheets of differing thickness and coefficient of friction (col. 19, lines 12-18), since sheets of differing thickness cause the feed amount to vary (col. 6, lines 53-67).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to improve the printing apparatus of Asano et al. as modified by Walker et al. by including a detector for detecting the type of medium to be printed, so that the printing apparatus may form the dots for correcting the feed amount when the medium has been exchanged.

Allowable Subject Matter

Claims 6 and 14 are allowed.

Please see Office Action dated 11/16/2006 concerning reasons for allowance.

Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 16 contains allowable subject matter since the prior art of record does not disclose, teach, or make obvious a printing apparatus comprising a plurality of print heads, wherein each of the plurality of print heads has a black nozzle row, a cyan nozzle row, a magenta nozzle row, and a yellow nozzle row. It is this limitation, in

combination with other features and limitations of claim 16, that indicates allowable subject matter over the prior art of record.

Response to Arguments

Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection. Please see the above obviousness rejection based on the disclosures provided by Asano et al. and Walker et al. This combination shows that it was obvious, at the time of invention, to utilize a controller in the printing apparatus to control the printing of dots for correcting feed amount.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Communication with the USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHELBY FIDLER whose telephone number is (571)272-8455. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on (571) 272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LUU MATTHEW/
Supervisory Patent Examiner, Art Unit 2861

/Shelby Fidler/
Examiner, Art Unit 2861